

**REMARKS**

In the Office Action,<sup>1</sup> the Examiner rejected claims 1-26 under 35 U.S.C. § 101 as directed to non-statutory subject matter; rejected claims 1-4 and 6-17 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 7,027,050 to Dunnett et al. ("Dunnett") in view of a publication titled "Cellular Modeling in Arbitrary Dimension Using Generalized Maps" by Levy et al. ("Levy").

By this amendment, Applicants amend independent claims 1-13, 15, 16, and 18-26 and cancel claims 14 and 17. Claims 1-13, 15, 16, and 18-26 remain pending and under current examination.

**I. Regarding the rejections under 35 U.S.C. § 101**

In the Office Action, the Examiner rejected claims 1-26 under 35 U.S.C. § 101, alleging: "no tangible result is produced." Office Action at 2. Applicants disagree. Independent claim 1, for example, recites a "[m]ethod for creating an irregular mesh description and an embedded geometric description in a computer graphics system." This "geometric description" is a tangible result for creating and displaying geometric objects as output on a display. The geometric description may be stored by a computer system and used to render graphics on a display. Independent claim 6 recites this tangible result by claiming an "output interface for outputting said geometric description for representation on a display." Fig. 15 of Applicants' specification illustrates exemplary representations output on a display using the geometric descriptions.

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<sup>1</sup> The Office Action contains a number of statements reflecting characterizations of the related art and the claims. Regardless of whether any such statement is identified herein, Applicants decline to automatically subscribe to any statement or characterization in the Office Action.

Accordingly, independent claims 1 and 6 recite a tangible result: the “geometric description.”

Independent claims 13 and 18, although of different scope than claims 1 and 6, also recite statutory subject matter for at least the reasons discussed above with respect to claims 1 and 6. Applicants cancel claims 14 and 17, rendering the rejection of these claims moot. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejection of pending claims 1-13, 15, 16, and 18-26 under 35 U.S.C. § 101.

In the Office Action, the Examiner rejected claims 11-17 under 35 U.S.C. § 101 “because the claims contain a computer program, which is non-statutory subject matter because a program must be encoded on a computer readable medium for causing the computer to execute in order to be considered statutory subject matter.” Office Action at 3. Applicants amend claims 11, 12, 13, 15, and 16 as suggested by the Examiner, and cancel claims 14 and 17. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejection of pending claims 11-13, 15, and 16 under 35 U.S.C. § 101.

In the Office Action, the Examiner rejected claim 17 under 35 U.S.C. § 101, alleging “storing a computer program via a signal is a non-statutory natural phenomem[on].” Office Action at 4. Applicants respectfully traverse the Examiner’s rejection. Nevertheless, in an effort to expedite prosecution, Applicants cancel claim 17, rendering the Examiner’s rejection of claim 17 under 35 U.S.C. § 101 moot.

**II. Regarding the rejection under 35 U.S.C. § 103**

In the Office Action, the Examiner rejected claims 1-4 and 6-17 under 35 U.S.C. § 103(a) as being unpatentable over Dunnett in view Levy. Applicants respectfully submit that a prima facie case of obviousness has not been established with respect to pending claims 1-4, 6-13, 15, and 16.

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). M.P.E.P. § 2142, 8th Ed., Rev. 2 (May 2004), p. 2100-128.

A prima facie case of obviousness has not been established because, among other things, neither Dunnett nor Levy, taken individually or in combination, teaches or suggests each and every element recited by the claims.

Independent claim 1 recites a method for creating an irregular mesh description and an embedded geometric description in a computer graphics system including "receiving topological input data representing vertices and faces of an irregular mesh" (emphasis added). The Examiner asserts that Dunnett discloses this element with a "database [that] stores information about each triangle in each model, particularly about the edges and vertices of each triangle." Office Action at 5. However, as quoted by the Examiner, Dunnett discloses receiving a "polygonal mesh model" triangle section describing the boundary of a 3D object. Dunnett, col. 66: 66-67. A polygonal or triangle

mesh, as disclosed by Dunnett, is not an “an irregular mesh,” as recited by claim 1 (emphasis added). Levy fails to cure this deficiency of Dunnett, nor does the Examiner rely on Levy for such a teaching. See Levy, page 3.

Moreover, claim 1 recites “creating a G-map representation of the topology of said irregular mesh based on said input data” (emphasis added). The Examiner concedes that Dunnett fails to teach or suggest this element. Office Action at 6. Contrary to the Examiner’s assertion, Levy fails to cure this deficiency. Levy discloses a G-Map representation that “relies on no more than a single type of element together with a single type of relation to define the topology of arbitrary dimensional objects . . . .” Levy, abstract. However, Levy uses a regular structure provided by cellular partitioning, not an “irregular mesh,” as recited by claim 1.

Further, claim 1 recites “associating coordinates in space with the vertices of said irregular mesh.” The Examiner asserts that Dunnett discloses the claimed “associating” in Fig. 10 “where it is shown that vertices of the mesh have a corresponding coordinate.” Office Action at 5. Applicants disagree. Fig. 10 of Dunnett illustrates “control points [that] are used to calculate the [co]ordinates which define a cubic Bernstein-Bezier triangular patch.” Dunnett, col. 12:44-46. A Bernstein-Bezier triangular patch is not “an irregular mesh.” Therefore, the calculating of coordinates displayed in Fig. 10 of Dunnett does not constitute the claimed “associating coordinates in space with the vertices of said irregular mesh,” as recited by claim 1. Levy fails to cure this deficiency of Dunnett, nor does the Examiner rely on Levy for such a teaching.

Claim 1 also recites “creating a geometric description from said irregular mesh . . . .” The Examiner asserts: “Dunnett teaches creating a geometric description, or topology, from the mesh in column 7 lines 52-54.” But a topology is not a geometric description. See, e.g., Applicants’ specification at Figs. 2-4 and page 4, lines 1-3. Levy fails to cure this deficiency of Dunnett, nor does the Examiner rely on Levy for such a teaching.

Claim 1 further recites “creating a refined mesh based on said irregular mesh and said coordinates, using coordinates associated with the vertices of said refined mesh to compute control points.” The Examiner relies on Figs. 2 and 10 of Dunnett as allegedly disclosing these elements. Dunnett discloses in Fig. 2, step S16, refinement of a triangulation; Fig. 10 of Dunnett illustrates finding control points of a cubic Bernstein-Bezier triangular patch on a plane triangle. Refinement of a triangulation and finding control points on a triangular patch, as disclosed by Dunnett, does not constitute a teaching or suggest of “creating a refined mesh based on said irregular mesh and said coordinates, using coordinates associated with the vertices of said refined mesh to compute control points” as recited by claim 1. Levy fails to cure this deficiency of Dunnett, nor does the Examiner rely on Levy for such a teaching.

Because neither Dunnett nor Levy teaches or suggests each and every element recited by claim 1, no *prima facie* case of obviousness has been established with respect to claim 1 or dependent claims 2-4. Independent claims 6 and 13, although of different scope than claim 1, patentably distinguish from Dunnett and Levy for at least the same reasons discussed above with respect to claim 1. Claims 7-12, 15, and 16

depend from independent claims 6 and 13 and therefore include all of the elements recited therein. Applicants therefore respectfully request that the Examiner reconsider and withdraw the rejection of claims 1, 1-4 and 6-13, 15, and 16 under 35 U.S.C. § 103(a) as being unpatentable over Dunnett in view of Levy.

Moreover, dependent claim 2 recites: "wherein said refined mesh is created by applying a mesh refinement algorithm, and where each patch of irregular mesh is created as a surface spline associated with a quad of said irregular mesh." The Examiner asserts Dunnett discloses this element in col. 16, lines 54-58 and col. 32, lines 1-5. Office Action at 6. These portions of Dunnett disclose "refin[ing] each triangular polygon in the model of an object into a larger number of smaller triangles . . . ." Dunnett, col. 16: 55-57. Such a disclosure does not constitute a teaching or suggestion of creating a refined mesh to build the geometric description of the irregular mesh, as recited by claim 2 in view of claim 1. Levy fails to cure this deficiency of Dunnett, nor does the Examiner rely on Levy for such a teaching. For at least this additional reason, Applicants respectfully request that the Examiner reconsider and withdraw the rejection of dependent claim 2 under 35 U.S.C. § 103(a) as being unpatentable over Dunnett in view of Levy.

### **III. Conclusion**

In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration and reexamination of this application and the timely allowance of the pending claims.


Please grant any extensions of time required to enter this response and charge any additional required fees to our Deposit Account No. 06-0916.

Respectfully submitted,

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By: \_\_\_\_\_

  
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